

**California Regional Water Quality Control Board
Santa Ana Region
June 1, 2001**

ITEM: 18

SUBJECT: Supplemental Guidance for the Prioritization of Investigation and Cleanup of Underground Storage Tank Releases Containing MtBE - Response to Received Comments

DISCUSSION:

On January 19, 2001, the Santa Ana Regional Board conducted a public workshop to discuss and solicit comments on a draft guidance document for the prioritization and investigation of underground storage tank release sites which contain the gasoline additive MtBE. The document was also distributed electronically to State Board and Regional UST Program Managers and other interested parties, including gasoline retail companies, environmental consultants and water purveyors.

On March 13, 2001, Board staff discussed the draft guidance document at a meeting of a group of individuals that meet monthly at Cal State Fullerton to discuss issues regarding MtBE. Copies of the draft guidance document were given to all attendees at that meeting with a request for comments.

To date, only a few comments have been received. Those comments and responses are summarized below. Comments were received from the environmental consulting firms of Secor, Inc., Environmental Resolutions, Inc., Levine Fricke, and Erler & Kalinowski, and from Mobil Oil Company. Comments were also received from Yue Rong of the Los Angeles Regional Board staff.

Any comments received after the date of preparation of this staff report will be discussed at the Board meeting. An amended staff report will be available at that time, if necessary. A revised version of the guidance document is attached to this report. Changes made in response to comments are shown in italics. Absent any additional comments at the Board meeting, staff intends to distribute and begin implementing this guidance document.

1. Comments from Mr. Kevin Miskin, SECOR. Inc.

Comment #1-1

The difference between Classes I and II only consist of changes in task timelines, and do not establish an actual means of "ranking" sites.

Response #1-1

Staff acknowledges that the responses within Classes I and II are very similar, with the differences being in terms of the timeframes for implementing the tasks. However, several of the activities for Class II sites, such as the well survey, the interim remedial action plan, and quarterly monitoring of remedial activities, may be waived by the regulatory staff on a case-by-case basis.

This staggering of the timing of site activities at Class II sites, relative to the timing at Class I sites is, in staff's opinion, appropriate. This approach emphasizes a rapid response at Class I sites, soon after the knowledge of contamination is confirmed. The timeframes for Class II sites are appropriately longer for several reasons. The main reason for this is to direct available resources to the highest priority (Class I) sites. Also, the location and concentrations of MtBE at Class II sites allow for more time to respond. For Class II sites where the MtBE concentration is relatively low, natural processes may be sufficient to reduce the MtBE concentrations in the groundwater to acceptable values. Conceivably, this reduction in MtBE concentration could result in the re-classification of a Class II site to a Class III site, which would require only soil remediation.

Comment #1-2

The timelines for Classes I and II are very restrictive and will likely be unattainable for most environmental consultants. Adjustments to classes' timelines and a phased approach to the implementation of the guidelines are recommended.

Response #1-2

The general purpose of the guidelines is to elicit a quicker response at sites with extremely high concentrations of MtBE. The prioritization scheme discussed in the guidance document allows the emphasis to be placed on Class I sites, and allows for some flexibility at Class II sites through requests for timeframe extensions. The timeframes proposed in the guidance are appropriate to protect human health and the environment.

Comment #1-3

The timeframes do not appear to allow for delays caused by the length of regulatory staff's review and response. Similarly, it is feared that the proposed timeframes will not allow for sufficient time to fully evaluate geologic and hydrogeologic characteristics.

Response #1-3

It is staff's intent to expedite the review and approval process for MtBE impacted remediation projects. Staff will work with the consultants, local agencies, and the responsible parties to avoid any such delays. Class I sites are sites where there is an immediate threat to the environment. These sites should be investigated and remediated

without any delays. Board staff believes that the timeframes included in the proposed guidance are appropriate for protection of water quality and that these timeframes provide sufficient time to evaluate geologic and hydrogeologic conditions at the site.

Comment #1-4

What constitutes an Interim Remedial Action Plan? (The proposed timeline for Interim Remedial Action Plan to be developed within 2 months and implemented within 6 months appear so stringent as to contradict the intent of State Board Resolution #92-49, which require that dischargers shall have the opportunity to select cost-effective methods for detecting discharges or threatened discharges and methods for clean up or abating the effects thereof).

Response #1-4

In general, an Interim Remedial Action Plan is a temporary solution for immediate control of the source and to control the spread of the contaminant plume to the extent practicable, at an early date, and in a cost-effective manner. The selection of such an Interim Action Plan should be consistent with the intent of Res. No. 92-49.

Comment #1-5

The requirement for vertical delineation on all Class I and II sites, and the timelines for the implementation of this requirement may generate an increased potential of exacerbating existing groundwater concerns. It is my opinion that vertical delineation of MtBE should be implemented only under special circumstances (i.e., downward gradients, etc.) and only after careful consideration of geologic and hydrologic conditions...

Response #1-5

Board staff agrees with the comment and will make appropriate changes in the guidance document. It is expected that when delineating the vertical extent of MtBE contamination in the groundwater, appropriate precautionary measures would be implemented to prevent cross-contamination of deeper strata.

2. Comments from Mr. Kelly Brown, SECOR, Inc.**Comment #2-1**

Will the Santa Ana Regional Water Quality Control Board insure that the Local Oversight Program agencies follow this guidance document? Besides the normal appeal process, is there a process that we can use to check in with the Santa Ana RWQCB to insure that the local agencies are not being overly aggressive?

Response #2-1

The three local agencies within our Region have indicated that they are in agreement with the guidance document's content. However, it is only a guidance document. Board staff will request the Local Oversight Program agencies to implement the guidelines specified in this document.

Comment #2-2

With regard to the requirement for "immediate identification and control of the source of the gasoline leakage", the term "immediate" is vague.

Response #2-2

Compliance with the timeframes specified in the existing UST regulations is all that is intended here.

Comment #2-3

What will be required as a minimum standard of defining the vertical extent?

Response #2-3

The subject of vertical delineation of MtBE contamination is a complicated topic. Additional clarifications will be included in the guidance. Issues of where and how to characterize the vertical strata while not creating avenues for contaminant migration must be addressed on a site-specific basis.

3. Comments from Mr. Steve M. Zigan, Environmental Resolutions, Inc.

Comment #3-1

The draft guidelines proposed using the proximity to an active water supply well as one of the parameters to determine the appropriate response. However, this distance does not represent the time it will take the plume to reach that well. Instead, one should use site-specific data to estimate the time for the plume to reach that well.

Response #3-1

The distance to an active drinking water well is used only in the criteria for a Class I site. In the other classifications, this parameter is not utilized. Board staff agrees that travel time is an important criterion for prioritization, but we believe distance to a well is a more appropriate criterion for screening purposes.

Comment #3-2

Using the historic maximum MtBE concentration to determine the appropriate response may not be the best indicator of mass or risk to a resource. ERI recommends that the maximum MtBE concentration be used as a first estimate in determining the appropriate response. Alternatively, a more statistically correct method, such as the mean or the upper confidence level concentration multiplied by the area of the plume, be allowed in determining a representative concentration for the site.

Response #3-2

While the use of the maximum MtBE concentration observed in groundwater at a gasoline release site may seem overly conservative, it serves as a basic indicator of mass of gasoline impacting the groundwater. The use of mean concentration may considerably underestimate the site's threat.

Comment #3-3

Would the Board accept the plume as defined if one can convincingly extrapolate to the suggested definition standard of 5 ppb. ?

Response #3-3

Yes, the text will be modified to clarify this.

Comment #3-4

Would the effective use of a mobile treatment unit satisfy the requirement for the timely initiation of remediation of the core portion of the groundwater plumes?

Response #3-4

Staff would agree that the effective use of mobile treatment units would be appropriate for most cases. However, this decision has to be made on a site-specific basis and may not be universally applicable.

Comment #3-5

The draft guidelines require that soil remediation be continued until soils no longer act as a source of groundwater contamination. Will the historic practice of using asymptotic vapor concentrations as an indication of successful soil remediation?

Response #3-5

Staff believes that a combination of asymptotic vapor concentrations and core area confirmatory soil borings/analyses may be needed in most cases.

4. Comments from Mr. Rick Wilson, Erler & Kalinowski, Inc.

Comment #4-1

While the text states that a site would be a Class I site if free gasoline product is present, the accompanying table suggests that a site with free product is only a Class I site if it is within 2000 feet of an active drinking water well.

Response #4-1

The text will be corrected to reflect the criterion that is in the table.

5. Comments from Mr. Eric Nichols, Levine Fricke

Comment #5-1

There should be some kind of criteria that allows the site to be "downgraded", based on a thorough characterization and assessment of the threat to water supplies. In such a case, the remedial requirements would then be either reduced or the timeframes for implementation would be extended.

Response #5-1

The language in the guidance document will be revised to allow for an alternative classification approach to be proposed if it is supported by additional data.

6. Comments from Mr. Kiran Chaudhari, Mobil Oil Company

Comment #6-1

A primary objective of the guidance document is to promote a consistent regulatory approach to UST remediation within the Santa Ana Region. In order to promote a consistent regulatory approach within the Santa Ana Region, it is important that this guidance document be communicated to (and followed by) the local oversight programs within the Region.

From discussion with Board staff, it is expected that the Santa Ana Regional Water Quality Control Board will allow flexibility in stated deadlines and negotiation of site classification under appropriate circumstances. Similarly, while the regulatory agency is able to establish remediation objectives and to specify reasonable timelines for achieving such objectives, the responsible parties are able to select the remedial method that is considered capable of cost-effectively achieving the remedial goals. Furthermore, it is Mobil Oil's position that the use of mobile remediation equipment is appropriate in this pursuit.

Response #6-1

The primary goal of the guidance document is to provide consistency in responding to gasoline releases containing MtBE. It is expected that, with the implementation of this guidance, inconsistencies in responding to gasoline releases among the local agencies would be minimized.

While staff believes that the specified timelines are appropriate, there could be situations where these timelines may not be appropriate and staff will consider such cases on a case-by-case basis. The timelines in the guidance document are not mandatory.

The appropriateness of the use of mobile remediation equipment will be decided on a site-specific basis, and not in a general sense.

7. Comments of Mr. Yue Rong, Los Angeles Regional Water Quality Control Board

Comment #7-1

By using a pair of criteria (maximum MtBE concentration and distance to an active drinking water well), you create a situation where a site with only slightly lower MtBE concentrations or slightly greater distance will be classified differently from a site with slightly higher MtBE concentration or slightly smaller distance. (For example, a site with a maximum MtBE concentration of 49,000 ppb located 100 feet from an active drinking water well will be a Class II site, while a site with a MtBE concentration of 51,000 ppb located 1990 feet from an active well will be a Class I site.)

Response #7-1

Staff agrees with the commentor that this situation may arise. Such a situation could be a weakness of any prioritization scheme based on concrete thresholds. However, in an effort to create an easily applicable classification approach, it is staff's opinion that this is a very workable combination of site-specific factors.

Comment #7-2

Comment is the same as that in Comment 4-1.

Response #7-2

The text will be corrected to reflect the criterion that is in the table.

Comment #7-3

In order to fully quantify other compounds in gasoline, such as tert-butyl alcohol (TBA), EPA method 8260B should be utilized, rather than the stated 8260A.

Response #7-3

This correction will be made to the text of the guidance document.

**California Regional Water Quality Control Board
Santa Ana Region**

**Draft Supplemental Guidance for
Prioritization of Investigation and Cleanup of Underground Storage
Tank Releases Containing MtBE**

Introduction

Local agencies implementing the Underground Storage Tank (UST) Program and other interested parties have requested guidance for the prioritization of gasoline release cases containing methyl *tert*- butyl ether (MtBE) in the Santa Ana Region. This guidance document is intended to assist managers and staff at state and local regulatory agencies in the Santa Ana Region with the task of overseeing the investigation and cleanup of sites where there have been releases of MtBE-laden gasoline. This document is intended to supplement the site classification in the Final Draft Guidelines for the Investigation and Cleanup of MtBE and Other Ether-Based Oxygenates, dated March 27, 2000, from the State Water Resources Control Board.

The purpose of this guidance document is to describe a standardized and effective approach for dealing with petroleum releases containing fuel oxygenates, such as MtBE. Unlike traditional petroleum constituents, MtBE moves quickly and is slow to degrade in the subsurface environment. In order to avoid costly impacts to municipal supply wells and valued aquifers, a quick response to the release is critical in order to check the spread of the contaminants both horizontally and vertically. Although this is a guidance document and the timelines included here are not mandatory, Board staff believes that these criteria identify an appropriate response to sites where MtBE is present. Regulators will need to prioritize their cases and give greatest oversight to those sites that pose the greatest risk to the groundwater.

Background

California's Underground Storage Tank (UST) Program, in existence since 1984, was established to address the large number of UST releases. These sites, where generally unknown quantities of gasoline were released into the underlying soils and groundwater, were threatening drinking water supplies.

The addition of a group of fuel additives called oxygenates, such as MtBE, to gasoline supplies throughout the state at various times over approximately the last fifteen years has increased the potential for long-term drinking water impairment. The threat from MtBE to the drinking water resources of a community reliant on groundwater is much greater than that from other petroleum compounds. The finding of significant levels of MtBE in the

soils and groundwater beneath the majority of gasoline stations in the Santa Ana Region prompts a heightened level of concern for our groundwater resources.

In order to ensure that remediation begins quickly at sites with significant levels of MtBE (or benzene, when appropriate), this guidance document incorporates recommended time frames for the completion of plume characterization activities and the actual start-up of remedial actions. Application of these time frames to individual cases will require the consideration of site-specific extenuating circumstances, such as property access issues.

Classification of Sites by Threat

Gasoline release sites may create a variety of threats to the environment. These guidelines, however, prioritize sites based solely on threats to groundwater resources. Regulators may need to modify a site's priority based on other environmental threats.

Within the Santa Ana Region all groundwater subbasins are designated as drinking water sources and all releases that affect groundwater should be considered threats to drinking water supplies. Therefore, these guidelines do not prioritize sites based solely on the distance of the site from existing drinking water supply wells. However, if a UST site is situated relatively close to an active drinking water supply well, the potential threat the site could pose would be increased.

Thus, the threat to the groundwater resources' long-term beneficial uses from a particular UST release site is significantly influenced by the mass of contaminant released. The highest observed concentrations of MtBE in groundwater at the site and the persistence of such levels can be utilized as a data surrogate for actual contaminant mass released. Additionally, elevated priority must be given to UST sites with severe MtBE contamination that are also close to active drinking water wells.

Classifications

The following classifications have been generally developed based on the criteria discussed above. Priority for case oversight and remedial action will be in order from Class I to Class IV. The appropriate degree and pace of the remedial response for the different classes are addressed in the following text.

Groundwater Cases

Site Conditions	Class
Free Product (Gasoline)	Class I
>50,000 ppb MtBE, & less than 2000 feet from an active drinking water well	Class I
>50,000 ppb MtBE, & greater than 2000 feet from an active drinking water well	Class II
500 to 50,000 ppb MtBE	Class II
Less than 500 ppb MtBE	Class III

Other Types of Cases

Soils Only Cases	Class IV
Releases not overlying sources of drinking water	Class IV

If the site conditions are such that these classifications are considered by the responsible party to be overly stringent, alternative methods of classifying a particular site may be proposed to the overseeing agencies for consideration.

For sites that involve other types of petroleum hydrocarbons, such as diesel fuel, the appropriate response should be developed through discussion with the overseeing agency.

At this time, the oxygenate being most widely utilized by oil companies and being observed at gasoline release sites is MtBE. Other oxygenates, such as tert-butyl alcohol (TBA), are being observed at a number of sites at significant concentrations. The expected approach to the quantification of compounds other than MtBE is the application of a more exact chemical analysis, EPA Method 8260B, in order to quantify and monitor gasoline release sites for the presence of the various chemicals in gasoline. As more data are gathered regarding the presence of other chemicals of concern, additional guidance may be developed.

With regard to the vertical definition of groundwater impacts, it is expected that an appropriate degree of prudent and cautious exploration would be performed in order to avoid creating avenues for contamination to migrate. This would necessitate a progressive approach that would assess vertical gradients and chemical patterns in areas away from the contaminant source.

The following is a discussion of the descriptions and activities for each of the proposed classifications.

Class I Sites (Highest Priority)

Class I sites are those groundwater cases which have either one of two conditions. These sites have either:

- a maximum MtBE concentration above 50,000 parts per billion *within 2000 feet of an active drinking water well*, or
- free gasoline product floating on the watertable.

This designation can also be applied to sites in proximity to a drinking water supply well that is affected by gasoline-related contaminants.

The following regulatory actions are appropriate for Class I sites:

1. Require immediate identification and control of the source of the gasoline leakage.
2. Require definition of the lateral extent of the plume within six months.
(Extensions may be granted if access to adjacent properties is necessary.)

- (The plume definition activities should *be able to approximate* the 5 ppb. MtBE contour line.)
3. Require definition of the vertical extent of the plume within twelve months. (Extensions may be granted if access to adjacent properties is necessary.) (The plume definition activities should *be able to approximate* the 5 ppb. MtBE contour line.)
 4. Require a survey of all drinking water sources within a one-mile radius during the first three months.
 5. Require the submittal of quarterly groundwater monitoring reports.
 6. Require timely initiation of the remediation of the core portion of the groundwater plume. This should include the submittal of an Interim Remedial Action Plan within two months and its implementation within three months of its approval.
 7. Require the initiation of soil remediation within one year. Soil remediation should continue until soils no longer act as a source of groundwater contamination.
 8. Require the remediation of any remaining groundwater contamination (final remediation goals should be based on State Board Resolution No. 92-49).
 9. Require the installation of a sentinel well(s) within one year to monitor plume migration. *
 10. Report all monitoring and remedial activities on a quarterly basis.

* Regulatory agency staff may waive this item, if appropriate.

Class II Sites

Class II sites are those groundwater cases which have either:

Maximum MtBE concentrations above 50,000 ppb. and are more than 2000 feet from an active groundwater supply well, or maximum MtBE concentrations between 500 and 50,000 ppb.

The following regulatory actions are appropriate for Class II sites:

1. Require immediate identification and control of the source.
2. Require definition of the vertical and lateral extent of the plume within eighteen months. (Extensions may be granted if access to adjacent properties is involved.) (The plume definition activities should *be able to approximate* the 5 ppb. MtBE contour line.)
3. Require a survey of all drinking water sources within a one-mile radius during the first six months. *
4. Require the submittal of quarterly groundwater monitoring reports.
5. Require timely initiation of remediation of the core portion of the groundwater plume. This should include the submittal of an Interim Remedial Action Plan within two months and its implementation within three months of its approval. *(Extension of these time frames may be granted based on site-specific factors.)
6. Require the initiation of soil remediation within two years. Soil remediation should continue until soils no longer act as a source of groundwater contamination.

7. Require the remediation of any remaining groundwater contamination. (Final remediation goals should be based on State Board Resolution No. 92-49.)
8. Report all monitoring and remedial activities on a quarterly basis. *

* Regulatory agency staff may waive these items, if appropriate.

Class III Sites

Class III sites are those groundwater cases with maximum MtBE concentrations below 500 parts per billion. These cases have usually unknown quantities of gasoline released into the subsurface soils with relatively minor groundwater impacts.

For Class III sites, a site characterization process should include:

1. Adequate vertical and lateral definition of the extent of soil contamination,
2. Identification of any groundwater impacts,
3. Definition of the lateral extent of groundwater contamination, if necessary
4. Submittal of quarterly groundwater monitoring sampling reports, if necessary
5. Adequate remediation of soil contamination, and
6. Regular reporting of data gathering and remedial activities.

The contaminated soils should be remediated to the point that they can no longer act as a source of groundwater contamination. This remediation should typically be in the form of limited-volume soil excavation or limited-term soil vapor extraction. Following remedial activities, confirmation borings and/or groundwater monitoring will serve to verify sufficient contaminant removal.

Class IV Sites

Class IV sites are those gasoline releases in which only soils have been confirmed to have been affected, or those located in areas which overlie groundwater which does not meet the definition of a source of drinking water.

For Class IV sites, the site characterization process should include:

1. Adequate vertical and lateral definition of the extent of soil contamination,
2. Identification of any groundwater impacts,
3. Definition of the lateral extent of groundwater contamination, if necessary,
4. Submittal of quarterly groundwater monitoring sampling reports, if necessary,
5. Adequate remediation of soil contamination, if necessary, and
6. Regular reporting of data gathering and remedial activities.

As with Class III sites, the contaminated soils at Class IV sites should be remediated to the point that they can no longer act as a potential source of groundwater contamination. However, the remedial actions at some Class IV sites may differ from those appropriate for Class III sites (i.e., prevention of groundwater impacts) in that the degree of soil cleanup required may be based on the actual or anticipated land use for protection of

human health. Regulatory staff will determine the appropriate oversight and degree and pace of cleanup on a case-specific basis.